

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A method of processing images compressed using block based compression, comprising:

determining whether two blocks of pixels are neighboring blocks;

determining whether the two neighboring blocks are both subdivided, if it is determined that the two blocks are neighboring blocks; and

performing deblocking filtering on one or more edge pixels of the two neighboring blocks, after determining that at least one ~~both~~ of the two neighboring blocks is ~~are~~ not subdivided.

Claim 2 (Original): The method of claim 1, wherein determining whether two neighboring blocks are both subdivided comprises:

obtaining variance values of each of the two neighboring blocks;

comparing the variance values to a first threshold; and

determining whether the two neighboring blocks are both subdivided based upon the comparison of the variance values to the first threshold.

Claim 3 (Original): The method of claim 1, wherein determining whether two neighboring blocks are both subdivided comprises:

obtaining a block size assignment value; and

using the block size assignment value to determine whether the two neighboring values are subdivided.

Claim 4 (Currently Amended): The method of claim 1, further comprising:
~~determining whether one of the two neighboring blocks is subdivided, if both of the two neighboring blocks are not subdivided;~~
using a first deblocking filter on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is subdivided; and
using a second deblocking filter on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks is subdivided.

Claim 5 (Previously Presented): The method of claim 4, wherein using the second deblocking filter comprises using a two point averaging filter on two edge pixels of the two neighboring blocks.

Claim 6 (Previously Presented): The method of claim 4, further comprising:
obtaining one or more difference values of one or more edge pixels of the two neighboring blocks, if neither of the two neighboring blocks is subdivided;
comparing the one or more difference values to a second threshold; and
selecting the second deblocking filter based on the comparison of the one or more difference values to the second threshold.

Claim 7 (Previously Presented): The method of claim 6, wherein the obtaining one or more difference values comprises obtaining a first order difference between edge pixels of the two neighboring blocks.

Claim 8 (Previously Presented): The method of claim 6, wherein the obtaining one or more difference values comprises obtaining a second order difference between edge pixels of the two neighboring blocks.

Claim 9 (Original): The method of claim 6, wherein obtaining one or more difference values comprises:

obtaining difference values between three edge pixels of the two neighboring blocks; and
wherein selecting the second deblocking filter comprises:

using a Gaussian filter if at least two of the difference values are greater than the second threshold.

Claim 10 (Previously Presented): The method of claim 9, wherein using a Gaussian filter comprises using a six point Gaussian filter on six edge pixels of the two neighboring blocks, if the difference values are greater than the second threshold.

Claim 11 (Previously Presented): The method of claim 9, wherein using a Gaussian filter comprises using a four point Gaussian filter on four edge pixels of the two neighboring blocks, if two of the difference values are greater than the second threshold.

Claim 12 (Previously Presented): The method of claim 9, wherein selecting the second deblocking filter further comprises using an averaging filter on two edge pixels of the two neighboring blocks if one of the difference values is greater than the second threshold.

Claim 13 (Currently Amended): An apparatus to process images compressed using block based compression, comprising:

means for determining whether two blocks of pixels are neighboring blocks;

means for determining whether the two neighboring blocks are both subdivided, if it is determined that the two blocks are neighboring blocks; and

means for filtering one or more edge pixels of the two neighboring blocks, after determining that at least one ~~both~~ of the two neighboring blocks is ~~are~~ not subdivided.

Claim 14 (Original): The apparatus of claim 13, wherein the means for determining whether two neighboring blocks are both subdivided comprises:

- means for obtaining variance values of each of the two neighboring blocks;
- means for comparing the variance values to a first threshold; and
- means for determining whether the two neighboring blocks are both subdivided based upon the comparison of the variance values to the first threshold.

Claim 15 (Original): The apparatus of claim 13, wherein the means for determining whether two neighboring blocks are both subdivided comprises:

- means for obtaining a block size assignment value; and
- means for using the block size assignment value to determine whether the two neighboring values are subdivided.

Claim 16 (Currently Amended): The apparatus of claim 13, further comprising:

~~means for determining whether one of the two neighboring blocks is subdivided, if both of the two neighboring blocks are not subdivided;~~

- means for using a first deblocking filter on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is subdivided; and

- means for using a second deblocking filter on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks are subdivided.

Claim 17 (Previously Presented): The apparatus of claim 16, further comprising:

- means for obtaining one or more difference values of one or more edge pixels of the two neighboring blocks, if neither of the two neighboring blocks is subdivided;

- means for comparing the one or more difference values to a second threshold; and

- means for selecting the second deblocking filter based on the comparison of the one or more difference values to the second threshold.

Claim 18 (Original): The apparatus of claim 17, wherein the means for obtaining one or more difference values comprises:

means for obtaining difference values between three edge pixels of the two neighboring blocks; and

wherein the means for selecting the second deblocking filter comprises: means for using a Gaussian filter if at least two of the difference values are greater than the second threshold.

Claim 19 (Previously Presented): The apparatus of claim 18, wherein the means for using a Gaussian filter comprises means for using a six point Gaussian filter on six edge pixels of the two neighboring blocks, if the difference values are greater than the second threshold.

Claim 20 (Previously Presented): The apparatus of claim 18, wherein the means for using a Gaussian filter comprises means for using a four point Gaussian filter on four edge pixels of the two neighboring blocks, if two of the difference values are greater than the second threshold.

Claim 21 (Previously Presented): The apparatus of claim 18, wherein the means for selecting the second deblocking filter further comprises means for using an averaging filter on two edge pixels of the two neighboring blocks if one of the difference values is greater than the second threshold.

Claims 22 - 30 (Canceled).

Claim 31 (Currently Amended): An apparatus to process images compressed using block based compression, comprising:

a processor configured to determine whether two blocks of pixels are neighboring blocks and to determine whether the two neighboring blocks are subdivided if it is determined that the two blocks are neighboring blocks; and

a deblocking filter configured to filter one or more edge pixels of the two neighboring blocks, after determining that at least one of the two neighboring blocks are not subdivided.

Claim 32 (Original): The apparatus of claim 31, wherein the processor determines whether two neighboring blocks are divided using block size assignment information.

Claim 33 (Original): The apparatus of claim 31, wherein the processor determines whether two neighboring blocks are divided based upon variance values of each block.

Claim 34 (Currently Amended): A method of processing images compressed using block based compression, the method comprising:

- determining whether two neighboring blocks of pixels from an image are both subdivided; and

- performing deblocking filtering on one or more edge pixels of the two neighboring blocks of pixels, after determining that at least one ~~both~~ of the two neighboring blocks of pixels is ~~are~~ not subdivided.

Claim 35 (Previously Presented): The method of claim 34, wherein determining whether two neighboring blocks are subdivided comprises:

- determining a size of a first block of pixels of the two neighboring blocks of pixels;

- determining a block variance based on pixels of the first block of pixels; and

- determining that the first block of pixels is subdivided when the block variance exceeds a threshold value associated with the determined size.

Claim 36 (Previously Presented): The method of claim 34, further comprising:

- determining one or more difference values between one or more corresponding edge pixels of the two neighboring blocks of pixels;

- when one of the one or more difference values exceeds a threshold value, filtering the edge pixels using an averaging filter; and

- when two or more of the one or more difference values exceeds the threshold value, filtering the edge pixels using a Gaussian filter.

Claim 37 (Previously Presented): The method of claim 36, wherein the Gaussian filter comprises an N-point Gaussian filter, wherein N indicates two times a number of the one or more difference values that exceed the threshold value.

Claim 38 (Previously Presented): The method of claim 34, wherein determining whether two neighboring blocks of pixels from an image are subdivided comprises retrieving block size assignment information associated with a first block of pixels, wherein the block size assignment information indicates how the first block of pixels is subdivided.

Claim 39 (Currently Amended): The method of claim 34, further comprising:
when a first block of pixels of the two neighboring blocks of pixels is subdivided,
selecting two neighboring sub-blocks of pixels;
determining whether the two neighboring sub-blocks of pixels are both subdivided; and
performing deblocking filtering on one or more edge pixels of the two neighboring sub-blocks of pixels, when it is determined that at least one ~~both~~ of the two neighboring sub-blocks of pixels is ~~are~~ not subdivided

Claim 40 (Previously Presented): The method of claim 39, further comprising:
determining a size of a first sub-block of pixels of the two neighboring sub-blocks of pixels;
determining a sub-block variance based on pixels of the first sub-block of pixels;
determining that the first sub-block of pixels is subdivided when the sub-block variance exceeds a threshold value associated with the determined size.

Claim 41 (Previously Presented): The method of claim 34, further comprising:
obtaining one or more difference values of one or more edge pixels of the two neighboring blocks of pixels;
determining a number of the one or more difference values that exceed a threshold value;
and
selecting a deblocking filter based on the number.

Claim 42 (Previously Presented): The method of claim 41, wherein selecting the deblocking filter comprises:

- selecting a first deblocking filter when the number is equal to 1; and
- selecting a second deblocking filter when the number is greater than 1.

Claim 43 (New) A machine-readable medium comprising code that when executed by a processor causes the processor to:

- determine whether two blocks of pixels are neighboring blocks;
- determine whether the two neighboring blocks are both subdivided, if it is determined that the two blocks are neighboring blocks;
- perform deblocking filtering on one or more edge pixels of the two neighboring blocks, after determining that at least one of the two neighboring blocks is not subdivided; and
- output the filtered blocks to a display.

Claim 44 (New): The machine-readable medium of claim 43, wherein code that causes the processor to determine whether two neighboring blocks are both subdivided comprises code to cause the processor to:

- obtain variance values of each of the two neighboring blocks;
- compare the variance values to a first threshold; and
- determine whether the two neighboring blocks are both subdivided based upon the comparison of the variance values to the first threshold.

Claim 45 (New): The machine-readable medium of claim 43, wherein code to cause the processor to determine whether two neighboring blocks are both subdivided comprises code to cause the processor to:

- obtain a block size assignment value; and
- use the block size assignment value to determine whether the two neighboring values are subdivided.

Claim 46 (New): The machine-readable medium of claim 43, further comprising code to cause the processor to:

use a first deblocking filter on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is subdivided; and

use a second deblocking filter on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks is subdivided.

Claim 47 (New): The machine-readable medium of claim 46, wherein code to cause the processor to use the second deblocking filter comprises code to cause the processor to use a two point averaging filter on two edge pixels of the two neighboring blocks.

Claim 48 (New): The machine-readable medium of claim 46, further comprising code to cause the processor to:

obtain one or more difference values of one or more edge pixels of the two neighboring blocks, if neither of the two neighboring blocks is subdivided;

compare the one or more difference values to a second threshold; and

select the second deblocking filter based on the comparison of the one or more difference values to the second threshold.

Claim 49 (New): The machine-readable medium of claim 48, wherein code to cause the processor to obtain one or more difference values comprises code to cause the processor to obtain a first order difference between edge pixels of the two neighboring blocks.

Claim 50 (New): The machine-readable medium of claim 48, wherein the code to cause the processor to obtain one or more difference values comprises code to cause the processor to obtain a second order difference between edge pixels of the two neighboring blocks.

Claim 51 (New): The machine-readable medium of claim 48, wherein:

code to cause the processor to obtain one or more difference values comprises code to cause the processor to obtain difference values between three edge pixels of the two neighboring blocks; and

code to cause the processor to select the second deblocking filter comprises code to cause the processor to use a Gaussian filter if at least two of the difference values are greater than the second threshold.

Claim 52 (New): The machine-readable medium of claim 51, wherein code to cause the processor to use a Gaussian filter comprises code to cause the processor to use a six point Gaussian filter on six edge pixels of the two neighboring blocks, if the difference values are greater than the second threshold.

Claim 53 (New): The machine-readable medium of claim 51, wherein code to cause the processor to use a Gaussian filter comprises code to cause the processor to use a four point Gaussian filter on four edge pixels of the two neighboring blocks, if two of the difference values are greater than the second threshold.

Claim 54 (New): The machine-readable medium of claim 51, wherein code to cause the processor to select the second deblocking filter further comprises code to cause the processor to use an averaging filter on two edge pixels of the two neighboring blocks if one of the difference values is greater than the second threshold.